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Integrating the Sterile Insect and Related Nuclear and Other Techniques

BOOK OF ABSTRACTS

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"Boosted SIT" as an Additional Tool an AW-IPM Programmes

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Recently, we hypothesized that shifting the vision of the sterile male from a sexual competitor only to a specific transporter of active biocides to the targeted female might boost the impact of the sterile insect technique (SIT).

In the REVOLINC (Revolutionizing Insect Control) project, we are demonstratating this concept using three biocides: Pyriproxifen, *Bacillus thuringiensis* and a Densovirus against the tiger mosquito (*Aedes albopictus*). Pyriproxifen is also tested against tsetse (*Glossina palpalis gambiensis*) and fruit flies (*Ceratitis capitata*). The technology is presently tested in the laboratory and preliminary results will be presented, as well as a model predicting the relative impacts of SIT and boosted-SIT on the dynamics of the targeted populations. The next steps will be to validate the predictions in operational field trials and compare the evolutionary response of the target populations to these different control pressures (multiple lethal mutations, multiple lethal mutations + biocides, biocides alone), for the three different biocides and three demographic strategies.

This will generate breakthrough knowledge on the transmission of biocides and pathogens in insects and the sustainability of genetic control, provide a new control technique for mosquitoes, and improve the cost-effectiveness of SIT in tsetse and fruit flies. We are also addressing technical issues associated to mass-rearing, sterilization, sex separation and aerial release of mosquitoes as well as regulatory issues required for releasing sterile males carrying various biocides.

The methodology of the project will be presented, as well as the intermediary results. The REVOLINC project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 682387).